

**Consolidated Water Use Efficiency 2002 PSP  
Proposal Part One:  
A. Project Information Form**

1. Applying for (select one): ☐ (a) Prop 13 Urban Water Conservation Capital Outlay Grant  
☐ (b) Prop 13 Agricultural Water Conservation Capital Outlay Feasibility Study Grant  
☒ (c) DWR Water Use Efficiency Project  
California State University, Fullerton
2. Principal applicant (Organization or affiliation):
3. Project Title: Campus ET Controller/ Irrigation System  
Conservation Upgrade
4. Person authorized to sign and submit proposal:
- |                 |   |
|-----------------|---|
| Name, title     | Lon McClanahan, Acting<br>Director        |
| Mailing address | P.O. Box 6850<br>Fullerton, CA 92834-6850 |
| Telephone       | (714) 278-2106                            |
| Fax.            | (714) 278-3000                            |
| E-mail          | lmccclanahan@fullerton.edu                |
5. Contact person (if different):
- |                  |  |
|------------------|--|
| Name, title.     | Steve Dugas,<br>Manager of Landscape<br>Services |
| Mailing address. | P.O. Box 6806, Fullerton CA<br>92834-6806        |
| Telephone        | (714)278-3929                                    |
| Fax.             | (714)278-2100                                    |
| E-mail           | sdugas@fullerton.edu                             |
6. Funds requested (dollar amount): \$266,027
7. Applicant funds pledged (dollar amount):
8. Total project costs (dollar amount): \$266,027
9. Estimated total quantifiable project benefits (dollar amount): 40,390.61
- Percentage of benefit to be accrued by applicant:
- Percentage of benefit to be accrued by CALFED or others:

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A. Project Information Form (continued)**

10. Estimated annual amount of water to be saved (acre-feet):

85

Estimated total amount of water to be saved (acre-feet):

on-going

Over \_\_\_\_ years

annually

Estimated benefits to be realized in terms of water quality,  
instream flow, other:

11. Duration of project (month/year to month/year):

10/01/02--01/31/03

12. State Assembly District where the project is to be conducted:

72nd

13. State Senate District where the project is to be conducted:

33rd

14. Congressional district(s) where the project is to be conducted:

39th

15. County where the project is to be conducted:

Orange

16. Date most recent Urban Water Management Plan submitted  
to the Department of Water Resources:

17. Type of applicant (select one):  
Prop 13 Urban Grants and Prop 13  
Agricultural Feasibility Study Grants:

- ☐ (a) city  
☐ (b) county  
☐ (c) city and county  
☐ (d) joint power authority  
☐ (e) other political subdivision of the State,  
including public water district  
☐ (f) incorporated mutual water company

DWR WUE Projects: the above  
entities (a) through (f) or:

- ☐ (g) investor-owned utility  
☐ (h) non-profit organization  
☐ (i) tribe  
☒ (j) university  
☐ (k) state agency  
☐ (l) federal agency

18. Project focus:

- ☐ (a) agricultural  
☐ (b) urban

**Consolidated Water Use Efficiency 2002 PSP  
Proposal Part One:**

**A. Project Information Form (continued)**

19. Project type (select one):  
Prop 13 Urban Grant or Prop 13  
Agricultural Feasibility Study Grant  
capital outlay project related to:

- ☐ (a) implementation of Urban Best Management Practices
- ☐ (b) implementation of Agricultural Efficient Water Management Practices
- ☐ (c) implementation of Quantifiable Objectives (include QO number(s))

- ☐ (d) other (specify)

DWR WUE Project related to:

- ☐ (e) implementation of Urban Best Management Practices
- ☐ (f) implementation of Agricultural Efficient Water Management Practices
- ☐ (g) implementation of Quantifiable Objectives (include QO number(s))
- ☐ (h) innovative projects (initial investigation of new technologies, methodologies, approaches, or institutional frameworks)
- ☐ (i) research or pilot projects
- ☐ (j) education or public information programs
- ☒ (k) other (specify)

ET Controller installation

20. Do the actions in this proposal involve physical changes in land use, or potential future changes in land use?

- ☐ (a) yes
- ☒ (b) no

If yes, the applicant must complete the CALFED PSP Land Use Checklist found at [http://calfed.water.ca.gov/environmental\\_docs.html](http://calfed.water.ca.gov/environmental_docs.html) and submit it with the proposal.

**Consolidated Water Use Efficiency 2002 PSP  
Proposal Part One  
B. Signature Page**

By signing below, the official declares the following:

The truthfulness of all representations in the proposal;

The individual signing the form is authorized to submit the proposal on behalf of the applicant; and

The individual signing the form read and understood the conflict of interest and confidentiality section and waives any and all rights to privacy and confidentiality of the proposal on behalf of the applicant.

\_\_\_\_\_  
Signature

Lon McClanahan, Acting Director  
Name and title

\_\_\_\_\_  
Date

## Proposal Part Two:

### Project Summary

In 1999 the University embarked on an aggressive water conservation program. The program was to be implemented in phases over a Three-year period. In phase one, the University employed the services of an irrigation management-consulting firm who completed an extensive irrigation/landscape audit for the entire 50.2 acres of landscaped areas. As part of the consultant's recommendations, modifications (zone reconfigurations, correct nozzle installations, booster pumps added) to the system have been implemented so as to surpass the targeted efficiency rating of 70+%. Upon completion of those modifications, the University, under the direction of Steve Dugas, has been installing ET controllers on a yearly basis. To date, 10 of the 28 required controllers have been installed. **Because of the current state budget problems, this project has been put on hold indefinitely, unless another source of funding can be located.** Upon completion of this project, the University expects to be able to conserve in excess of 80 AF of water annually, calculated on a base year (average of 1996 and 1997 usage) usage of 301 AF. At current water rates, that equates to savings in excess of \$40,000 annually.

The ET. Controller replaces the conventional time clock used to control when sprinklers come on and how long the watering cycle continues. The ET Controller used in this Proposal receives a signal in the same manner as a pager. The signal originates from a local weather station that measures the Eto rate, or the weather conditions that determine the moisture evaporation rate from the soil and plants. The ET controller uses the data from the weather station, which adjust the watering cycle to meet the varying needs.

### A. Scope of work: Relevance and Importance

Water Issues, Need and Consistency with other Plans:

Efficient use of the limited supplies of water available in California is critical. Landscape irrigation, as demonstrate through substantial research, is an essential element of effective water conservation. Currently CSUF does not have the option to utilize reclaimed water and must rely on potable water only. Therefore all efforts to curtail unnecessary, and unwise irrigation practices contribute directly to the goals of **CALFED. The University is committed to being a responsible public agency.** In addition, reduction in irrigation results in lower levels of undesired chemicals (salts, fertilizers, pesticides and herbicides) which directly impact the water quality of our groundwater supplies. The proposed program is a new component of CSUF current "Integrated Utility/Resource Conservation Plan." This program is an ongoing effort by the University to become a "more responsible neighbor" by reducing waste and expenses in an attempt to better meet the educational needs of a growing community on what seems to be an ever shrinking budget. Water waste directly impacts the University's ability to provide much needed facilities improvements not to mention the acquisition of learning supplies and equipment. With the State's budget in turmoil, the University is being forced to reduce cost. Water conservation is a very painless proactive way to save funds, which has no negative impact on the local community, while having a very positive impact on the environment.

## Proposal Part Two:

### The installation of ET Controllers:

- ET controllers embedding breaking technology can be operated via broadcast signal by the University's horticulture expert from a central location.
- Behavior is key to landscape savings and savings persistence (training, controller adjustment, sprinkler system maintenance and adjustment, choice of crop palate); ET controllers remove variability in water savings induced by behavioral factors.
- Controllers can be adjusted to water at night, and can adjust throughout the year based on seasonal pattern and recent climate conditions.
- The broadcast signal can be used to turn off irrigation on rainy days.
- As part of this ongoing program, the University performs periodic surveys to ensure the delivery system is being maintained to perform at least at a minimum uniformity rating of 70%. ET controllers can improve overall cost-effectiveness of the irrigation system.

### **Statement of Critical Local, Regional, Bay-Delta, State and Federal Water Issues**

#### Why is this project needed?

- Historically, there has been a low level of investment in landscape conservation because of the relatively low cost of water as compared to other utilities, even though irrigation utilizes more than 60% of the University's water.
- Efficient landscape irrigation needs seasonal adjustments, which requires the knowledge and time that because of a shortage man-hours may not be attended to.
- Landscape water needs are seasonal and correlated with water supply climate and seasonal patterns (summer high, winter low, temperature correlation; rainfall inverse correlation).
- Runoff from landscape irrigation is a major source of water contaminants to surface waters and sewer systems—efficient irrigation practices can reduce runoff.
- Runoff is also important to shallow aquifers where groundwater is under the influence of surface water.
- Landscape irrigation needs associated with energy demand peaks (diurnal and seasonal variation)
- Southern California, including Orange County rely substantially on imported water—including the water imported from the Bay-Delta ecosystem.
- Runoff is one of the major contributing factors to pollution in along the Southern California coast.

### **B. Scope of Work: Technical/Scientific Merit, Feasibility, Monitoring and Assessment Methods, procedures and facilities:**

It is generally accepted throughout the landscape and conservation industry that ET Controllers are the most effective tools available for delivering and monitoring proper amounts of water to landscaped areas. This is true as long as the actual irrigation system is maintained to a proper standard. The University is very motivated to complete this project and has already spent a considerable amount of time and money upgrading their irrigation system to ensure the effectiveness of the ET Controllers will be maximized.

## Proposal Part Two:

### Task List, Schedule & Associated Cost:

- Initial Irrigation/Landscape Audit, completed in 02/00, cost...\$22,500
- Irrigation System Retrofits, cost.....\$128,724

**Total expenditures to date \$151,224**

- 18 ET Controllers:
  - Hardware and Materials, cost .....\$216,331
  - Labor, cost .....\$27,000

**Total financial requirement for project completion \$243,331**

**Total Project Cost, \$394,555**

- Completion time, 120 days from time funding is approved

### Monitoring and assessment:

The following “pre-survey” was developed by the Irrigation Management Consultant prior to being employed by the University. The base year numbers were calculated using historical usage data from the years 1996 and 1997. The actual water requirement was calculated from historical ET data received from CIMIS. The monthly usage requirements will act as the University’s target numbers.

MONTH	1996	1997	BASE YEAR		H2O REQUIREMENT		POTENTIAL SAVINGS		POTENTIAL YEAR 1
	HCF	HCF	HCF	AF	HCF	AF	HCF	AF	\$ SAVINGS
Jan	2838	271	1555	3.6	2661	6.1	0	0.0	0.00
Feb	2050	5372	3711	8.5	3144	7.2	567	1.3	617.68
Mar	4730	9093	6912	15.9	4475	10.3	2437	5.6	2656.21
Apr	9908	11549	10729	24.6	5442	12.5	5286	12.1	5762.19
May	10018	14610	12314	28.3	5563	12.8	6751	15.5	7358.56
Jun	16975	12032	14504	33.3	6531	15.0	7973	18.3	8690.56
Jul	20803	18051	19427	44.6	7498	17.2	11929	27.4	13002.62
Aug	18307	15608	16958	38.9	7377	16.9	9580	22.0	10442.69
Sep	18918	18868	18893	43.4	5684	13.0	13209	30.3	14397.85
Oct	12965	13156	13061	30.0	4475	10.3	8586	19.7	9358.62
Nov	7488	7990	7739	17.8	3023	6.9	4716	10.8	5140.02
Dec	4831	5919	5375	12.3	2298	5.3	3077	7.1	3354.18
<b>TOTAL</b>	<b>129831</b>	<b>132519</b>	<b>131175</b>	<b>301.1</b>	<b>58170</b>	<b>133.5</b>	<b>74111</b>	<b>170.1</b>	<b>\$80,781.21</b>
Note: Usage reduced by 40% for human consumption					Total	BASE RATE \$1.09			
Acres 50.2									
Note: Program goals are based on achieving 50% of the potential savings.					<b>Program Goals:</b>		<b>37056</b>	<b>85.05</b>	<b>\$40,390.61</b>

Monthly usage will be monitored and recorded as water bills are received. Actual requirements will be based on “real time ET.”

## Proposal Part Two:

### C. Qualifications of Applicant:

#### **Steven M. Dugas**

15148 Dunton Drive

Whittier, CA 90604-1434

(714) 278-3929 (W) (562) 946-1167 (H)

#### **Work experience**

##### **California State University Fullerton**

800 N. State College Boulevard

Physical Plant T-123

Fullerton, CA 92834

*3/98 - Present*

**Manager of Landscape Services:** Management (all aspects) of landscape services, including pest control and irrigation services of a 200 acre urban university campus 25,000 student population also includes 17 acre sports complex containing 9,000 seat football stadium, 4,000 seat baseball stadium, 1,000 seat softball complex, track and practice fields, and supervision of 3 acre grounds at president's off-campus residence, supervising a staff of 19.

##### **Pepperdine University**

*1/96 – 2/98*

24255 Pacific Coast Highway

Malibu, CA 90263

**MANAGER FOR LANDSCAPING & IRRIGATION:** management (all aspects) of landscaping and irrigation of an 800 (330 developed) acre suburban university campus 4,000 student population, including off-campus properties, Baseball and Soccer fields, supervising a staff of 27.

##### **Pepperdine University**

*8/94 - 1/96*

24255 Pacific Coast Highway

Malibu, CA 90263

**ASSISTANT MANAGER FOR LANDSCAPING & IRRIGATION:** Assist in management of landscaping, with emphasis on irrigation and hydrogeological monitoring and pest/weed control, of an 800 (330 developed) acre university campus. Includes off-campus properties, supervising a staff of 28.

##### **Cerritos College**

*8/80 - 8/94*

11110 Alondra Boulevard

Norwalk, CA 90650

**LEAD GARDENER/GROUNDSKEEPER:** Responsible for supervision and assistance to a crew of twelve full-time Gardeners at a 140-acre community college campus including athletic facilities: Football Stadium, Baseball Stadium, softball Field and Soccer Field. Also provided support to Director of Grounds on all matters pertaining to operation of Grounds Department.

##### **Cerritos College**

*4/78 - 8/80*

11110 Alondra Boulevard

Norwalk, CA 90650

**GARDENER/GROUNDSKEEPER:** Responsible for designated area of campus. Job duties included: performance of routine grounds maintenance tasks,



## Proposal Part Two:

provide assistance in athletic event set-ups; provide guidance to assigned student hourly and/or work study employee.

### **The Irvine Company, Property Services Division**

1/78-4/78

Newport Beach, CA

**GARDENER I:** Assigned to crew responsible for total grounds maintenance of apartment complex and shopping center. Duties included: mowing, edging, tree trimming, pest control & sprinkler repair.

### **EDUCATION**

**California Polytechnic State University**, Pomona CA 2001-Present

Major study: ornamental horticulture working towards completion of b.s.

**Cerritos Community College**, Norwalk, CA, 1981 - 1982, 1983 - 1984 & 1990 A.A.

Degree: Ornamental Horticulture 1984

**Fullerton College**, Fullerton, CA 1979 - 1981 Major study: Ornamental Horticulture

**California Polytechnic State University**, San Luis Obispo, CA 1975 - 1977 Major study: Ornamental Horticulture

### **CERTIFICATES/LICENSE**

California Department of Food and Agriculture:

Qualified Applicators Certificate #41024 landscape maintenance and right of way categories

Pest Control Advisor License #02753, Insects, Mites and other Invertebrates category

Pesticide Handler and Fieldworker Instructor Certificate

International Society of Arboriculture Certified Arborist

#WC-1980

### **Professional Memberships**

Pesticide Applicators Professional Association

California Agriculture Production Consultants Association

International Society of Arboriculture

Sports Turf Managers Association

### **D. Benefits**

#### **Non-Quantified Project Outcomes and Benefits:**

##### **Regional and State Perspectives**

- Reduced demand for water imported from Northern California and the Colorado River ecosystems
- Reduced surface runoff and contamination
- Reduced demand on groundwater resources
- Reduce electrical demand for import related pumping and distribution system electricity demand management

##### **Water Agency Perspectives**

- Reduced demand for water imported from Northern California and the Colorado River ecosystems

##### **Wastewater Agency Perspectives**

- Reduced TDS load into system

## Proposal Part Two:

### **Groundwater Agency Perspectives**

- Reduced demand on groundwater resources

### **Local Community Perspectives**

- Reduce urban runoff from landscape irrigation by controlling irrigation more effectively
- Increased aesthetics due to less leaching of soil nutrients

### **Benefit Summary and Breakdown:**

As the largest single user of water within the City of Fullerton, the University feels they have an obligation to be as conservative as possible when utilizing a very limited resource such as water. But at the same time, the local community utilizes many of the schools sports facilities and open spaces for community-based projects and events. Therefore, we are obligated to maintain these venues to a safe and esthetically pleasing level. Our sports field and open areas meet those criteria, unfortunately our water use is not where we would like it to be. ET controllers will solve that problem. **Our goal is to reduce our consumption of water for the purpose of irrigation by 85AF annually or 28%.** We have currently exhausted all of our available assets in an attempt to make the University as “**conservation responsible**” as possible. Without this funding, we will fall miserably short of our intended goals.

## Proposal Part Two:

Model	Description	Qty.	Unit Price	Totals
Calsense Command 1	Water Management Software	1	\$ 7,283.23	\$ 7,283
CA6-CS1-12LR	12 Station Controller	8	\$ 7,680.06	\$ 61,440
CA6-CS1-8MLR	8 Station Controller	1	\$ 7,494.94	\$ 7,495
CA6-CS1-8LR	8 Station Controller	1	\$ 6,724.61	\$ 6,725
CA6-CS1-24LR	24 Station Controller	8	\$ 8,700.70	\$ 69,606
CLR_Dome	Antenne	18	\$ 275.21	\$ 4,954
CTP-1	Transient Board	18	\$ 395.00	\$ 7,110
CTP-110	AC Protection	18	\$ 294.01	\$ 5,292
315	Service Saddle	18	\$ 67.88	\$ 1,222
FMBX	Flow Sensor	18	\$ 780.65	\$ 14,052
LR Retrofit	Retro w Radiohardware	5	\$ 2,397.10	\$ 11,985
LR HUB	Local Radio Hub	1	\$ 4,101.24	\$ 4,101
LR-YAGI	Antenne	1	\$ 339.41	\$ 339
RR-TRAN	Transmitter	2	\$ 1,060.67	\$ 2,121
G Option	Calsense Interface	1	\$ 565.69	\$ 566
ETG	ET Gauge	1	\$ 1,725.35	\$ 1,725
ETGE	Enclosure	1	\$ 919.25	\$ 919
Miscellaneous	Materials/Supplies	1	\$ 8,044.87	\$ 8,045
Labor	Controller Installation	18	\$ 1,575.00	\$ 28,350
<b>Subtotal</b>				<b>\$ 243,331</b>
Overhead 25% of MTDC*				<b>\$ 22,696</b>
<b>TOTAL</b>				<b>\$ 266,027</b>

\*Modified Total Direct Costs (MTDC) are calculated at 25% of total costs **excluding** equipment costs over \$5,000